ABSTRACT

In one aspect of the invention, a method for pressurized annealing of lithium niobate or lithium tantalate structures, such as optical modulators and optical wave guides, comprises pressurizing an oxygen atmosphere containing a lithium niobate or lithium tantalate structure above normal atmospheric pressure, heating the structure to a temperature ranging from about 150 degrees Celsius to about 1000 degrees Celsius, maintaining pressure and temperature to effect ion exchange or to relieve stress, and cooling the structure to an ambient temperature at an appropriate ramp down rate.

In another aspect of the invention a lithium niobate structure such as an optical waveguide or an optical modulator comprises an optically transparent portion that is substantially void of free protons.